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ABSTRACT OF THE DISCLOSURE

A method for determining the ambient concentrations of a plurality of analytes in a liquid sample of volume V litres, comprises

5 loading a plurality of different binding agents, each being capable of reversibly binding an analyte which is or may be present in the liquid sample and is specific for that analyte as compared to the other components of the liquid sample, onto a
10 support means at a plurality of spaced apart locations such that each location has not more than $0.1 V/K$, preferably less than $0.01 V/K$, moles of a single binding agent, where K litres/mole is the equilibrium constant of the binding agent for the analyte;

15 contacting the loaded support means with the liquid sample to be analyzed, such that each of the spaced apart locations is contacted in the same operation with the liquid sample, the amount of liquid used in the sample being such that only an
20 insignificant proportion of any analyte present in the liquid sample becomes bound to the binding agent specific for it, and

measuring a parameter representative of the fractional occupancy by the analytes of the binding
25 agents at the spaced apart locations by a competitive or non-competitive assay technique using a site-recognition reagent for each binding agent capable of recognizing either the unfilled binding sites or the filled binding sites on the binding agent, said site-
30 recognition reagent being labelled with a marker enabling the amount of said reagent in the particular location to be measured. A device and kit for use in the method are also provided.